

Patent Attorneys

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Fax to: **Examiner J. Nguyen**
U.S. Patent and Trademark Office
Group Art Unit 3725

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From: Patrick J. G. Stiennon

Date: August 2, 2005

Time: _____

Our Ref.: FORSAL-36

This transmission has 20 pages (including this sheet)

There follows in Application No. 10/070,024.

- PTO/SB/21 Transmittal Form (1 p)
- PTO/SB/17 Fee Transmittal Form (1 p)
- Appeal Brief (17 pp)

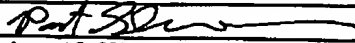

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TRANSMITTAL FORM (To be used for all correspondence after initial filing)		Application Number	10/070,024
		Filing Date	February 26, 2002
		First Named Inventor	Kari Holopainen
		Group Art Unit	3725
		Examiner Name	J. Nguyen
Total Number of Pages in This Submission		Attorney Docket Number	FORSAL-36
<input checked="" type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment / Response <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/ Incomplete Application <input type="checkbox"/> Response to Missing Parts Under 37 CFR 1.52 or 1.53		<input type="checkbox"/> Assignment Papers (For an Application) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition Routing Slip (PTO/SB/69) And Accompanying Petition <input type="checkbox"/> To Convert a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Small Entity Statement <input type="checkbox"/> Request for Refund	
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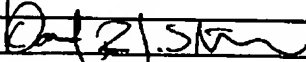
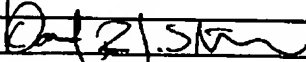
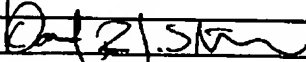
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ADDITIONAL FEES</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Large Entity</th> <th colspan="2">Small Entity</th> <th rowspan="2">Fee Description</th> <th rowspan="2">Fee Paid</th> </tr> <tr> <th>Fee Code</th> <th>Fee (\$)</th> <th>Fee Code</th> <th>Fee (\$)</th> </tr> </thead> <tbody> <tr> <td>105</td> <td>130</td> <td>205</td> <td>65</td> <td>Surcharge - late filing fee or oath</td> <td></td> </tr> <tr> <td>127</td> <td>50</td> <td>227</td> <td>25</td> <td>Surcharge - late provisional filing fee or cover sheet</td> <td></td> </tr> <tr> <td>139</td> <td>130</td> <td>139</td> <td>130</td> <td>Non-English specification</td> <td></td> </tr> <tr> <td>147</td> <td>2,520</td> <td>147</td> <td>2,520</td> <td>For filing a request for reexamination</td> <td></td> </tr> <tr> <td>112</td> <td>920*</td> <td>112</td> <td>920*</td> <td>Requesting publication of SIR prior to Examiner action</td> <td></td> </tr> <tr> <td>113</td> <td>1,840*</td> <td>113</td> <td>1,840*</td> <td>Requesting publication of SIR after Examiner action</td> <td></td> </tr> <tr> <td>115</td> <td>110</td> <td>215</td> <td>55</td> <td>Extension for reply within first month</td> <td></td> </tr> <tr> <td>116</td> <td>400</td> <td>216</td> <td>200</td> <td>Extension for reply within second month</td> <td></td> </tr> <tr> <td>117</td> <td>920</td> <td>217</td> <td>460</td> <td>Extension for reply within third month</td> <td></td> </tr> <tr> <td>118</td> <td>1,440</td> <td>218</td> <td>720</td> <td>Extension for reply within fourth month</td> <td></td> </tr> <tr> <td>128</td> <td>1960</td> <td>228</td> <td>980</td> <td>Extension for reply within fifth month</td> <td></td> </tr> <tr> <td>119</td> <td>320</td> <td>219</td> <td>160</td> <td>Notice of Appeal</td> <td></td> </tr> <tr> <td>120</td> <td>320</td> <td>220</td> <td>160</td> <td>Filing a brief in support of an appeal</td> <td></td> </tr> <tr> <td>121</td> <td>280</td> <td>221</td> <td>140</td> <td>Request for oral hearing</td> <td></td> </tr> <tr> <td>138</td> <td>1,510</td> <td>138</td> <td>1,510</td> <td>Petition to Institute a public use proceeding</td> <td></td> </tr> <tr> <td>140</td> <td>110</td> <td>240</td> <td>55</td> <td>Petition to revive - unavoidable</td> <td></td> </tr> <tr> <td>141</td> <td>1,280</td> <td>241</td> <td>640</td> <td>Petition to revive - unintentional</td> <td></td> </tr> <tr> <td>142</td> <td>1,280</td> <td>242</td> <td>640</td> <td>Utility Issue fee (or reissue)</td> <td></td> </tr> <tr> <td>143</td> <td>460</td> <td>243</td> <td>230</td> <td>Design Issue fee</td> <td></td> </tr> <tr> <td>144</td> <td>620</td> <td>244</td> <td>310</td> <td>Plant Issue fee</td> <td></td> </tr> <tr> <td>122</td> <td>130</td> <td>122</td> <td>130</td> <td>Petitions to the Commissioner</td> <td></td> </tr> <tr> <td>123</td> <td>50</td> <td>123</td> <td>50</td> <td>Petitions related to provisional applications</td> <td></td> </tr> <tr> <td>126</td> <td>180</td> <td>126</td> <td>180</td> <td>Submission of Information Disclosure Statement</td> <td></td> </tr> <tr> <td>581</td> <td>40</td> <td>581</td> <td>40</td> <td>Recording each patent assignment per property (times number of properties)</td> <td></td> </tr> <tr> <td>146</td> <td>740</td> <td>246</td> <td>370</td> <td>Filing a submission after final rejection (37 CFR 1.129(a))</td> <td></td> </tr> <tr> <td>149</td> <td>740</td> <td>249</td> <td>370</td> <td>For each additional invention to be examined (37 CFR 1.129(b))</td> <td></td> </tr> <tr> <td colspan="4">Other fee (specify)</td> <td></td> <td></td> </tr> <tr> <td colspan="4">Other fee (specify) Filing a brief in support of an appeal</td> <td></td> <td>\$500.00</td> </tr> <tr> <td colspan="4">*Reduced by Basic Filing Fee Paid</td> <td colspan="2">SUBTOTAL (3) \$500.00</td> </tr> <tr> <td colspan="6">SUBMITTED BY</td> </tr> <tr> <td colspan="2">Typed or Printed Name</td> <td colspan="2">David R.J. Stiennon</td> <td colspan="2">Complete (if applicable)</td> </tr> <tr> <td colspan="2">Signature</td> <td colspan="2"></td> <td colspan="2">Reg. 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In The United States Patent And Trademark Office

Applicant: Kari Holopainen et al. Date: August 2, 2005
Date Filed: February 26, 2002 Docket No.: FORSAL-36
App. No.: 10/070,024 Art Unit: 3725
For: Shoe Roll Examiner: J. Nguyen

<p align="center">Certificate of Facsimile Transmission</p> <p>I hereby certify that this correspondence is being transmitted via facsimile to the U.S. Patent and Trademark Office</p> <p align="center">on <u>8/2/05</u> Date</p> <p align="center"> Signature</p> <p align="center"><u>Patrick J. G. Stiennon, Reg. No. 34934</u> Name of applicant, assignee or Registered Representative</p>

Brief of Appellants

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Subsequent to Applicant's Notice of Appeal, dated Jun. 3, 2005, this Appeal Brief is submitted.

1. Real Party In Interest (37 C.F.R. §1.192(c)(1))

This application has been assigned to Metso Paper, Inc., a Finnish corporation having offices at Helsinki, Finland.

2. Related Appeals And Interferences (37 C.F.R. §1.192(c)(2))

There are no related appeals or interferences.

3. Status of Claims (37 C.F.R. §1.192(c)(3))

The application was filed as a U.S. national stage of a PCT application. A preliminary

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amendment was filed canceling claims 1–13 and adding new claims 14–31. A second preliminary amendment was filed on Aug. 26, 2002, canceling claim 30, amending claims 29 and 31 and adding new claim 32. In the first Office action mailed Sept. 15, 2004, claims 26–28 and 31 were rejected under 35 U.S.C. §112; claims 29 and 31 were rejected under U.S.C. §102(e) and all the claims were rejected under 35 U.S.C. §103(a). On Dec. 15, 2004, the claims were amended, new claim 33 was added, and claim 19 was canceled. In a second and final Office Action mailed Mar. 4, 2005, claims 14–33 were rejected under 35 U.S.C. §103(a) and claim 33 was rejected under 35 U.S.C. §112 as adding new matter. In an after final amendment filed Jun. 3, 2005, claim 33 was amended to increase clarity.

Claims 14–18, 20–29, 31–33 remain pending in the application.

Claims 14–18, 20–29, 31, 33 are the subject of this appeal.

4. Status of Amendments (37 C.F.R. §1.192(c)(4))

An amendment filed on Jun, 3, 2005, affecting only claim 33 was considered and entry was refused. An amendment filed on Aug. 2, 2005 cancelling claim 32, and correcting a minor typographical error in claim 18 (replacing “the the” with “the”) has not yet been considered or entered.

5. Summary of the Invention (37 C.F.R. §1.192(c)(5))

All citations are to the Clean Copy of the Substitute Specification.

A multi-roll calender, supercalender, or soft calender which has at least one nip (YN, PN1, KN, PN2, AN) profiling a fibrous web passing through the calender. A shoe roll (1, 4, 6, 10) constitutes at least one of the calender rolls which define the nip and wherein the shell (11, 41, 61, 101) of the shoe roll is of a composite material, and the shoe roll is provided with internal shell-loading shoes (12, 42, 43, 62, 63, 103) for profiling the shell, the nip or the fibrous web. (Abstract, p. 17, lines 1–7.) The composite material of the shell of the shoe roll is made with a fibre orientation such that the shell is more rigid in the circumferential direction than in the axial direction. (P. 7, lines 19–21.) The fiber orientation of the composite

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material is arranged such that a major proportion of the fibers have been wound at an angle of over 45°, preferably in the range of 70°–90° with respect to the axis of the roll. (P. 8, line 28–p. 9, line 3.)

The calender can have two stacks of three rolls placed one upon the other, the rolls of the stacks being displaceable so as to provide one operation nip between the middle two rolls, or two operation nips in each of the two stacks. (P. 7, lines 22–25.) The shoe roll can be arranged so that the loading at the nip can be simultaneously changed by means of individual shoes or a group of shoes which are spaced from one another in the circumferential direction, i.e. the load of the nip can be increased and/or reduced, thereby providing successive nips which profile in the same way and enhance the result of calendaring. The invention also makes it possible for all the nips of a multi-roll calender to be profiling nips by means of the shoe rolls, and makes possible that the top and/or the bottom roll of a multi-roll calender, such as a supercalender, can be made a profiling roll. (P. 8, lines 15–22.)

The calender can be changed by arranging the middle rolls into nip contact with each other or apart from each other into nip contact with the middle roll of their own stack. (P. 9, lines 4–7.) By dimensioning the positioning of the roll shafts, the diameters of the roll shells and the distances of the radial movement of the roll shells in a suitable manner, the change can be accomplished by only displacing roll shells, i.e. separate transfer devices for displacement of the entire roll are not needed. (P. 9, lines 12–15.)

The shoe rolls 1, 4, 6, 10 are hydraulically zone-controlled so that each roll is supported from a non-rotating central shaft of the roll by means of a hydrostatic loading arrangement 12; 42; 43; 62; 63; 103, such as a row of loading shoes which transfer the nip force acting on the composite shell rotating around the central shaft to the central shaft. (P. 12, lines 14–19.)

7. Issues (37 C.F.R. §1.192(c)(6))

Issue 1. Has the examiner made out a prima facie case of obviousness of claims 14, 16, 20–23, and 33, over the combination of *Hirvonen* in view of *Ehrola et al.*; and with respect to claims 22–23 further in view of *van Haag*, or has the examiner made out a prima facie case of

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obviousness of claims 14–15, 17–18, 24–29, 31, and 33 over the combination of *Beckers* in view of *Ehrola et al.*?

- A. Has the examiner provided some suggestion of the desirability of doing what the inventor has done? Do the references expressly or impliedly suggest the claimed invention?
- B. Does the examiner present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references?
- C. Is there teaching of a suggestion to make the claimed combination and the reasonable expectation of success which can both be found in the prior art, and not based on applicant's disclosure?

8. **Grouping of Claims (37 C.F.R. §1.192(c)(7))**

The claims appealed form one group: claims 14–18, 20–29, 31, and 33.

The claims of the groups *do not* stand or fall together.

9. **Argument (37 C.F.R. §1.192(c)(8))**

Discussion of References

Hirvonen is a wet stack calender which provides an apparatus for separating the control of the moisture profile from the control of the web caliper and smoothness. (Col. 2, lines 33–34, 41–42.) This is accomplished by carrying water from a “waterbox directly into the profiling nip where at least a portion of the water is transferred to the web. The amount of water transferred can be varied in the cross-machine direction by varying the nip pressure in the respective profiling zones. By providing a nip having several profiling zones immediately adjacent to the waterbox, [*Hirvonen*] advantageously allows the moisture profile to be directly controlled in the wet stack calender without effecting any significant variation in caliper or smoothness.”(Col. 2, lines 49–58) It is true that *Hirvonen* shares some common structure with the claimed invention however

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Hirvonen discloses a calendar directed to a very different purpose i.e., moisture profiling, and does not contain any suggestion or expectation of success with respect to the construction of the claimed invention.

Ehrola et al. Shows a composite roll shell similar to the claimed construction, however, use in a calender is not suggested.

Beckers discloses a deflection compensated roller which has a shell supported on a fixed beam by a single row of loading shoes contrary to the examiners's statement on p. 5, line 5, of the Office action mailed Sept. 15, 2004, that *van Haag* shows "rows of loading shoes". *Van Haag* further does not show a composite roll shell as claimed in the application.

Beckers is directed to an online calender which can provide different levels of calendaring to an online paper web. *Beckers* dose not show a composite roll shell as claimed by applicant. *Beckers* shows intermediate rolls which are mounted on pivoting arms contrary to applicant's disclosure. The calender art is a process of spinning straw into gold. With the addition of only moisture, heat and pressure the value of a paper web is increased. Thus if a particular calender arrangement is advantageous, the benefit can be large. The prior art teaches many combinations and permeations of various arrangements of rolls and various pressures, temperatures, and moisturizing means, which are designed to cost-effectively improve the quality of the paper web, thereby making it more valuable while the raw materials going into the web remain substantially constant. The examiner has constructed applicant's claimed invention by selecting elements from the prior art. But a nearly infinite variety of calenders can be constructed by arranging known parts and technical features. The applicant has selected a particular arrangement out of these myriads of possibilities and disclosed its utility. In order to make a prima facie case the examiner must show that there is a motivation and expectation of success which would guide a person of ordinary skill at the time the invention was made to construct the invention without applicant's disclosure as a blueprint.

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Issue 1.

A. Has the examiner provided some suggestion of the desirability of doing what the inventor has done? Do the references expressly or impliedly suggest the claimed invention?

There is no suggestion within the references of doing what the applicants have done. The examiner has not shown a calendar as claimed with one or more composite roll shells as claimed. All anticipation rejections have been overcome. The examiner starts his argument for the combination of *Hirvonen* and *Ehrola et al.* by finding that steel is a composite material. While steel or cast iron are alloys of carbon and steel, the common understanding in the art is that metal alloys are not composite materials, this is also made clear in the specification where applicant distinguishes metal rolls. See <http://www.matter.org.uk/matsciodrom/manual/co.html> where a web page about a CD product based on *An Introduction to Composite Materials*, D.Hull and T.W.Clyne, Cambridge University Press (1996) answers the question:

What is a Composite Material?

Most composites have strong, stiff fibres in a matrix which is weaker and less stiff. The objective is usually to make a component which is strong and stiff, often with a low density. Commercial material commonly has glass or carbon fibres in matrices based on thermosetting polymers, such as epoxy or polyester resins. Sometimes, thermoplastic polymers may be preferred, since they are mouldable after initial production. There are further classes of composite in which the matrix is a metal or a ceramic. For the most part, these are still in a developmental stage, with problems of high manufacturing costs yet to be overcome. Furthermore, in these composites the reasons for adding the fibres (or, in some cases, particles) are often rather complex; for example, improvements may be sought in creep, wear, fracture toughness, thermal stability, etc.

Further, the language of the claims makes clear the "outer shell is of continuous-fibre reinforced composite material" (claim 14, line 5) which cannot be interpreted as reading on metal. The examiner next makes use of his equating steel to composite material to find a suggestion in *Hirvonen* that the calendar rolls may be made of a composite material and therefore the composite roll disclosed in *Ehrola et al.* is only a variation on the steel or cast iron disclosed in *Hirvonen*.

The examiner simply has not found a reference suggesting that a calendar be made using

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composite rolls where the composite properties of the roll are arranged such that "the fiber orientation being such that the composite material outer shell is more rigid in the circumferential direction than in the axial direction" (claim 14, lines 8–10).

The examiner makes a similar argument with respect to *Beckers* which does not discuss the composition of the rolls at all. The examiner states "*Beckers* does not disclose the outer shell of the shoe rolls are formed by the specific type of composite material as claimed." (Office action mailed Mar. 4, 2005, page 5, the antepenultimate and penultimate lines.) This statement is negative pregnant that *Beckers* discloses the use of composite rolls, which it does not. Without some suggestion within *Beckers* or *Ehrola et al.* to use the composite roll disclosed in *Ehrola et al.* in the calendar of *Beckers*, the references cannot reasonably be said to provide a suggestion for combination.

B. Does the Examiner present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references?

In response to applicant's arguments set forth in applicant's first response, the examiner finds the arguments not persuasive (Office action mailed Mar. 4, 2005, p. 7, line 12) "because *Beckers* and *Hirvonen* disclose a calendar having a roll nip press between a shoe roll and another roll for treating paper web..." and "*Ehrola* teaches the type of shoe roll having an outer shell (11) made of a continuous-fibre [sic] reinforced composite material in order to maintain the shape of the outer shell (see col. 1, lines 56-64)." (Office action p. 7, lines 15–17, 18–20.) The examiner's reasoning is that the references are all used to process paper so any combination of the references would be obvious. This reasoning is simply a restatement of the teaching of the reference without any reasoning, other than that the references are from the same general art, and does not explain why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. *Beckers*, *Hirvonen*, and *Ehrola et al.* are simply placed before the person of ordinary skill without further reasoning.

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C. Is there teaching of a suggestion to make the claimed combination and the reasonable expectation of success which can both be found in the prior art, and not based on applicant's disclosure?

In *Sensonics Inc. v. Aerosonic Corp.*, 38 USPQ2d 1551, 1554 (Fed. Cir. 1996) the Court agreed with the trial court that the references did not render the invention obvious stating:

There is no teaching or suggestion whereby a person of ordinary skill would have been led to select these mechanical and electrical structures and concepts and combine them as did DeMayo in the '114 invention. To draw on hindsight knowledge of the patented invention, when the prior art does not contain or suggest that knowledge, is to use the invention as a template for its own reconstruction – an illogical and inappropriate process by which to determine patentability. *W.L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). The invention must be viewed not after the blueprint has been drawn by the inventor, but as it would have been perceived in the state of the art that existed at the time the invention was made. *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985).

The Examiner has presented references *Hirvonen*, *Ehrola et al.*, *van Haag*, and *Beckers* in view of *Ehrola et al.* on which obviousness type rejections are based, but has not made a legally sufficient argument for how a person of ordinary skill in the art at the time of the invention would have found the claimed invention obvious in view of the references. The examiner states an advantage of *Ehrola et al.* as the motivation for combination with *Hirvonen* or *Beckers*. The examiner asserts the rationale for combination as “in order to improve the stability of shape of the outer shells in the direction of the circumference...” and “in order to maintain the shape of the outer shell of their shoe rolls.” (Office action mailed Mar. 4, 2005, p. 7, lines 8–9, and p. 8, lines 1–2.) However, the examiner is not *the person of ordinary skill at the time of invention*. In order to support a prima facie case, the examiner must show more than the bare fact that the combination could be made, and if made would have advantages. The examiner is taking on the role of inventor, suggesting a calender based on the references, and stating the examiner's reasons for making the combination and expecting the combination to be successful. Rather than

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taking on the role of inventor, the examiner must show that at the time of the invention *the person of ordinary skill* would have been motivated to make the combination, and would have had an expectation that the combination would prove successful. In view of the examiner's failure to make a prima facie case of obviousness all the claims pending in the case should allowed.

Separate Argument for claims 16 & 23

Claims 16 and 23 claim a plurality of rows of internal shell-loading shoe means within the shoe roll, the rows being uniformly spaced with respect to one another in the circumferential direction of the composite material outer shell. This feature is not shown in *Ehrola et al.*, and although known as shown in *Hirvonen*, is not suggested by the art of record for use with a composite roll shell of the type claimed.

Separate Argument for claims 26 & 27

Claim 26 claims a very specific calendar arrangement comprised of two stacks of three rolls and wherein the upper stack lower roll and the lower stack upper roll can be separated from contact with rolls of their own roll stack into nip contact with each other. Whereas *Korhonen et al.* (US 5,590,593) might be argued to teach a similar arrangement (see col. 7, lines 13-24), there is clearly no suggestion to construct applicant's claimed invention. First, *Korhonen et al.* does not show the upper stack lower roll and lower stack upper roll being both separated from the rolls of their stacks while in nipping engagement. Second there is no suggestion of the use of composite rolls in *Korhonen et al.* Claim 27 further adds the limitations that the upper stack lower roll and the lower stack upper roll are fixedly mounted, whereas *Korhonen et al.* shows the upper stacked lower roll being mounted to a pivoting arm.

Separate Argument for claims 29 & 31

The arguments set forth above with respect to claims 16, 23 and 26 separately, when combined together support the allowability of claim 29. Claim 29 includes two stacks of three rolls and a plurality of rolls having one row of internal shell-loading shoe means and "the shoe

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means being operable to load the first intermediate roll against the first press roll and the second intermediate roll against the second press roll, or alternatively to load the first intermediate roll against the second intermediate roll.” Further, claim 29 claims two rolls with composite shells further distinguishing over *Ehrola et al.* which discloses only a single roll with composite shell.

The arguments set forth with respect to claim 27 support patentability of claim 31 separately from claim 29.

Separate Argument for claim 33

Claim 33 sets forth “wherein at least two superimposed intermediate calender rolls are shoe rolls having a shell of a fibre reinforced composite material the fiber orientation being such that the composite shell is more rigid in the circumferential direction than in the axial direction” *Eheola et al* shows only one composite roll shell and does not provide any reason or motivation for using two rolls having shells of the fiber reinforced composite.

A clarifying amendment to claim 33 was offered but refused entrance in an advisory action mailed Aug. 22, 2005. Claim 33 as originally presented was and remains clear. The amendment was only offered for the purpose of responding to the examiner’s misreading of the claim to require three intermediate rolls, and thus, according to the examiner’s reading, adding new matter. The examiner in the advisory action mailed Jul. 22, 2005, found that the proposed amendment overcame his interpretation, making it clear that two calender rolls having shells of fiber reinforced composite material were set forth in claim 33 and found that the proposed amendment removed the issue of new matter. However, the examiner concluded that further consideration and a search would be necessary. It is submitted that claim 33 as amended, does not raise new issues that would require consideration over the search previously preformed, as the claim prior to and after amendment still required that “at least two superimposed intermediate calender rolls are shoe rolls....”

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Conclusion

In view of the Examiner's failure to make out a prima facie showing of obviousness it is requested that the Examiner's rejection of the appealed claims be overruled.

Respectfully submitted,



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Appendix (37 C.F.R. §1.192(c)(9))

The following claims are on appeal:

14. A calender having a plurality of calender rolls arranged one upon the other, and including a top calender roll and a bottom calender roll, and defining in operation at least one profiling nip for profiling a fibrous web that is being calendered, at least one of the calender rolls defining the profiling nip being a shoe roll comprising an outer shell and at least one row of internal shell-loading shoe means for profiling the shell, the nip and the fibrous web as well as for controlling contact in the nip, the improvement comprising:

the shoe roll is located between the top and bottom calender rolls;

the shoe roll outer shell is of continuous-fibre reinforced composite material, the fiber orientation being such that the composite material outer shell is more rigid in the circumferential direction than in the axial direction; and

the at least one row of internal shell-loading shoe means of the shoe roll is arranged parallel to a nip defined against the shoe roll.

15. The calender of claim 14 wherein the plurality of calender rolls further comprises a first press roll below the upper roll, and a first intermediate roll below the first press roll, and a second press roll above the bottom calender roll, and a second intermediate roll above the second press roll, and wherein both the first intermediate roll and the second intermediate roll are shoe rolls.

16. The calender of claim 14 wherein there are a plurality of rows of internal shell-loading shoe means within the shoe roll, the rows being uniformly spaced with respect to one another in the circumferential direction of the composite material outer shell.

17. The calender of claim 14 wherein the top calender roll is a shoe roll.

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18. The calender of claim 14 wherein the the bottom calender roll is a shoe roll.
20. The calender of claim 14, wherein the continuous-fibre reinforced composite material includes plastic or epoxy reinforced by glass fibres or carbon fibres, and that in order to provide a shell which is more rigid in the circumferential direction in relation to the axial direction of the shoe roll, orientation of the fibres of the composite material has been accomplished such that a major proportion of the fibres of the composite material of the shell of the shoe roll are directed at an angle of over 45° with respect to the axis of the shoe roll.
21. The calender of claim 20, wherein the angle is in the range of 70°-90°.
22. The calender of claim 14 wherein the shoe roll is a hydraulically zone-controlled roll, the composite shell of which is supported from a non-rotating central shaft of the shoe roll by means of hydrostatic loading arrangements which transfer the nip force directed at the composite shell rotating around the central shaft so as to be carried by the central shaft.
23. The calender of claim 22 wherein the hydrostatic loading arrangements comprise rows of loading shoes.
24. The calender of claim 14 wherein the calender has at least one intermediate roll positioned between the calender top roll and the calender bottom roll, and wherein at least one of the top roll, the at least one intermediate roll, and the bottom roll is a shoe roll.
25. The calender of claim 14 wherein in calender operation, the shoe roll is separable from a nip forming contact with a press roll or another shoe roll.

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26. The calender of claim 14 wherein the plurality of calender rolls comprises two stacks of three rolls, one of the two stacks defining an upper stack the top roll being the uppermost roll of the upper stack, and the other of the two stacks defining a lower stack, the lower roll being the lowermost roll of the lower stack, the upper stack being placed upon the lower stack such that between the two stacks there remains a space which is defined by a lower roll of the upper stack and by an upper roll of the lower stack, the shoe roll being one of the upper stack lower roll and the lower stack upper roll, wherein the bottom roll of the upper stack and the top roll of the lower stack can be separated from contact with rolls of their own roll stack into nip contact with each other.

27. The calender of claim 26 wherein the bottom roll of the upper stack and the top roll of the lower stack are shoe rolls having roll shells, and at least the bottom roll of the upper roll stack and the top roll of the lower roll stack are fixedly mounted on a calender frame such that their shells can be displaced in the direction of the roll stack with respect to roll supports of the rolls.

28. The calender of claim 27 wherein at least the bottom roll of the upper roll stack and the top roll of the lower roll stack are provided with loading members located inside their roll shells.

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29. A calender for treatment of a fibrous web passing therethrough, the calender comprising:

- a frame;
- a top roll mounted to the frame;
- a first press roll mounted to the frame beneath the top roll;
- a first intermediate roll mounted to the frame beneath the first press roll, wherein the top roll, the first press roll, and the first intermediate roll comprise a first roll stack;
- a second intermediate roll mounted to the frame beneath the first intermediate roll;
- a second press roll mounted to the frame beneath the second intermediate roll;
- a bottom roll mounted to the frame beneath the second press roll, wherein the second intermediate roll, the second press roll, and the bottom roll comprise a second stack; and

wherein the first intermediate roll and the second intermediate roll are shoe rolls, each having outer shells of continuous-fibre reinforced composite material, the fiber orientation being such that the composite material outer shell is more rigid in the circumferential direction than in the axial direction, and each having at least one row of internal shell-loading shoe means, the shoe means being operable to load the first intermediate roll against the first press roll and the second intermediate roll against the second press roll, or alternatively to load the first intermediate roll against the second intermediate roll.

31. The calender of claim 29 wherein the first intermediate roll and the second intermediate roll are fixedly mounted on the frame such that their shells can be displaced in the direction of the first roll stack or the second roll stack respectively with respect to roll supports of the rolls.

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33. A multi-roll calender for calendering a fibrous paper web, the calender comprising:
a plurality of rolls arranged one upon the other and defining in operation at least one profiling nip for profiling the fibrous paper web,
wherein at least one intermediate calender roll located between a top calender roll and a bottom calender roll of the multi-roll calender is a shoe roll which defines said at least one profiling nip together with another calender roll, the at least one shoe roll comprising a non-rotating central shaft, a shell rotating around the central shaft, and at least one row of internal shell-loading shoes being supported on the central shaft so that one row is arranged in the plane of the at least one profiling nip;
wherein at least two superimposed intermediate calender rolls are shoe rolls having a shell of a fibre reinforced composite material the fiber orientation being such that the composite shell is more rigid in the circumferential direction than in the axial direction, said shell being displaceable in relation to the central shaft in order to separate the two superimposed intermediate shoe rolls from a nip forming contact with another calender roll or another shoe roll in calender operation.

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The following amended claim 33 was submitted in the amendment dated Jun. 3, 2005, but was not entered:

33. (currently amended) A multi-roll calender for calendering a fibrous paper web, the calender comprising:
a plurality of rolls arranged one upon the other and defining in operation at least one profiling nip for profiling the fibrous paper web[.];
wherein at least ~~[[one]]~~ two of said plurality of rolls are intermediate calender rolls located between a top calender roll and a bottom calender roll of the multi-roll calender, wherein the at least two intermediate calender rolls are [[is a]] shoe rolls, and wherein each shoe roll defines ~~which defines said~~ at least one profiling nip together with another calender roll, ~~the at least one~~ each shoe roll comprising a non-rotating central shaft, a shell rotating around the central shaft, and at least one row of internal shell-loading shoes being supported on the central shaft so that ~~the~~ at least one row is arranged in the plane of the at least one profiling nip;
wherein ~~two of the~~ at least two ~~superimposed~~ intermediate calender rolls ~~[[are]]~~ which are shoe rolls ~~having~~ are superimposed and have a shell of a fibre reinforced composite material, the fiber orientation being such that the composite shell is more rigid in the circumferential direction than in the axial direction, said shell being displaceable in relation to the central shaft in order to separate the two superimposed intermediate shoe rolls from a nip forming contact with another calender roll or another shoe roll in calender operation.